

ABSTRACT

This invention is a synchronization abstraction layer (SAL) providing a uniform interface to frameworks operating on sequenced
5 flow data. It allows content developers to design and build interactive content that will operate interchangeably in different multimedia frameworks (e.g., Apple Computer, Inc.'s QuickTime™, Microsoft Corporation's NetShow™, RealNetworks, Inc.'s RealPlayer™, Sun Microsystems, Inc.'s Java™ Media Framework) and on different
10 hardware platforms (e.g., desktop PC, Macintosh™, Television set-top boxes such as those from General Instrument Corporation and Scientific Atlanta Inc., Inc., Internet appliances such as AOL™-TV, and other appliances, e.g., a kitchen Internet radio). The uniform interface is independent of the particular framework and the
15 platform on which the SAL is implemented, so that a single instance of content, whether created in Java™, JavaScript, VBscript, HTML, XML, or some other language, can run appropriately on different hardware, e.g., on a Television set-top and on a desktop PC.

In one realization, the synchronization abstraction layer
20 provides a Java™ VIRTUAL MACHINE (JVM) interface for running Java™ plug-ins for streaming media applications such as Real Networks, Inc.'s RealPlayer™, Microsoft Corporation's Windows Media Technologies (NetShow™), Apple Computer, Inc.'s QuickTime™, Sun Microsystems, Inc.'s Java™ Media Framework. The JVM interface

allows third-party developers to design platform- and framework-independent plug-ins for streaming media applications.

5 This invention allows content providers to use plug-ins or compatible software objects (such as Java™ applets) to build, for example, interactive streaming media content that is fully interactive but independent of the particular underlying hardware and software technologies, such as RealNetworks™ G2, Microsoft Corporation's NetShow™, a desktop PC, or a television.